



WORLD HEALTH

Framework for Evaluating the Impact of Advanced Practice Nursing Roles

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Abstract

Purpose: To address the gap in evidence-based information required to support the development of advanced practice nursing (APN) roles in Switzerland, stakeholders identified the need for guidance to generate strategic evaluation data. This article describes an evaluation framework developed to inform decisions about the effective utilization of APN roles across the country.

Approach: A participatory approach was used by an international group of stakeholders. Published literature and an evidenced-based framework for introducing APN roles were analyzed and applied to define the purpose, target audiences, and essential elements of the evaluation framework. Through subsequent meetings and review by an expert panel, the framework was developed and refined.

Findings: A framework to evaluate different types of APN roles as they evolve to meet dynamic population health, practice setting, and health system needs was created. It includes a matrix of key concepts to guide evaluations across three stages of APN role development: introduction, implementation, and long-term sustainability. For each stage, evaluation objectives and questions examining APN role structures, processes, and outcomes from different perspectives (e.g., patients, providers, managers, policy-makers) were identified.

Conclusions: A practical, robust framework based on well-established evaluation concepts and current understanding of APN roles can be used to conduct systematic evaluations.

Clinical Relevance: The evaluation framework is sufficiently generic to allow application in developed countries globally, both for evaluation as well as research purposes.

Internationally, there is a high demand for advanced practice nursing (APN) roles to address unmet population health needs and improve the quality, efficiency, and sustainability of healthcare services (Bryant-Lukosius, 2014). The International Council of Nurses (ICN) defines an advanced practice nurse as a "registered nurse who has acquired the expert knowledge base, complex decision-making skills and clinical competencies for expanded practice, the characteristics of which are shaped by the context or country in which [she or he] is credentialed to practice" (ICN, 2008, p. 7). The clinical nurse specialist (CNS) and nurse practitioner (NP) are the most common types of APN roles (Delamaire & Lafortune, 2010; Schober, 2013). In some countries such as Canada, these roles are well established, while in other countries like Switzerland, APN roles are emerging and poised for expansion.

Few countries have proactively or systematically evaluated APN roles, resulting in a dearth of context-relevant evidence to support decision making about the effective use of these roles (DiCenso et al., 2010). As with any healthcare innovation, the failure to evaluate is risky and may limit the impact and long-term sustainability of APN roles. The purpose of this article is to describe an evaluation framework developed for APN roles in Switzerland. While APN roles in Switzerland were the impetus, the assumptions and concepts underpinning the evaluation framework are purposively broad to be generalizable to APN roles in other countries.

Background

Switzerland is at an early stage of APN role development but is positioned for expansion with the establishment of education programs, introduction of pioneer roles, and national efforts of the nursing profession to create a regulatory framework (Morin, Ramelet, & Shaha, 2013). There is no legal definition or recognition of APN in Switzerland, but the ICN (2008) definition and APN competencies defined by Hamric (2014) are accepted within the nursing profession. Education is offered at the master's level, but APN curricula are not standardized across programs (Swiss Association for Nursing

Science, 2012). Advanced practice nurses work in roles resembling the CNS. Increasingly, specialist roles are being developed in response to patient needs for chronic disease management (Bundesamt für Gesundheit, 2012), but the types of APN roles required or the priorities for their introduction have not been determined.

Establishing a framework for evaluation at this early stage of APN role development has advantages to promote effective role integration into the Swiss healthcare system. Systematic approaches to evaluation are necessary to make decisions about the optimal design and use of APN roles in new models of care to improve outcomes. A systematic framework would help to anticipate, prioritize, and guide the need for different types and foci of evaluation. For example, initial evaluations could assess the types and number of APN roles (e.g., CNS, NP) needed and the education required to achieve expected outcomes.

Multiple systematic reviews have demonstrated the effectiveness of APN roles for improving patient health and quality of care and reducing healthcare utilization and costs (Bryant-Lukosius et al., 2015; Donald et al., 2015; Newhouse et al., 2011). These studies also indicated a need for conceptually stronger evaluation designs to improve the quality of research and to address knowledge gaps about cost effectiveness and how APN roles contribute to improved patient, provider, and health system outcomes (Donald et al., 2014; Marshall et al., 2015). There is also a need for research to evaluate the impact of nonclinical APN role activities (e.g., leadership, research; Bryant-Lukosius, DiCenso, Israr, & Charbonneau-Smith, 2013).

Role clarity is essential for successful APN implementation (DiCenso et al., 2010). Lack of theory-based evaluations contribute to poorly defined roles with unclear connections between activities and outcomes, and may account for studies reporting no differences in APN outcomes when compared to usual care (Bryant-Lukosius et al., 2015). Lack of a theoretical framework also results in evaluations that fail to capture data about why APN outcomes are not achieved, and thus missed opportunities to refine roles and address barriers to achieve better outcomes.

Methods

The need for an evaluation framework arose in 2012 at a Swiss APN conference. To pursue this issue, the Institute of Nursing Science at the University of Basel convened a group of 15 stakeholders including researchers, advanced practice nurses, APN educators, and health-care administrators from Germany, Switzerland, Canada, and the United States. From January 2013 to May 2015, this group participated in teleconferences, workshops, and meetings to (a) review and promote shared learning about healthcare and APN evaluation models and evidence about APN evaluations; (b) examine issues about APN role development and evaluation in Switzerland from various perspectives; (c) define the purpose, scope, and target audiences for an evaluation framework; and (d) come to consensus on the framework elements and tools for application. Once the group was satisfied with the framework, an expert panel was assembled to provide feedback. The panel completed an evaluation form and met with the group to discuss the feedback and decide the next steps for strengthening and disseminating the framework.

PEPPA, a Participatory Evidence-Informed Patient-Centred Process for APN Role Development, guided construction of the evaluation framework (Bryant-Lukosius & DiCenso, 2004). PEPPA outlines steps for introducing and evaluating APN roles. With use in over 16 countries, including Switzerland (Boyko, Carter, & Bryant-Lukosius, in press; Serena et al., 2015), and translation in several languages, direction provided by PEPPA promotes applicability of the evaluation framework to diverse jurisdictions. Conceptually, PEPPA encourages the design of patient-centered models of care. It incorporates principles for effective health human resource planning and has been used successfully to introduce APN and other health provider roles (Bryant-Lukosius et al., 2013). PEPPA fosters role clarity by addressing the complexity of APN roles and engaging stakeholders (e.g., patients, providers, administrators), who influence and are influenced by the role design, implementation, and evaluation process. PEPPA offers broad recommendations for evaluation. The enhanced framework outlined in this article was named PEPPA-Plus because it builds on this previous work to provide more detailed guidance for APN role evaluations.

Results

Evaluation Framework Goal and Objectives

The ultimate goal of the evaluation framework is to promote optimal health outcomes for patients and

families and to deliver high-quality, patient-centered, and cost-effective care in Switzerland through evidence-informed decision making about the development and use of APN roles in varied practice settings and models of care delivery. This goal will be achieved through these objectives to:

- Provide guidance about sequential steps and systematic approaches for APN role evaluation that are necessary to produce timely, high quality data.
- Identify important information and decision-making needs relevant to three stages of APN role development: introduction, implementation, and long-term sustainability.
- Conduct evaluations that identify and are appropriate for different types of current, emerging, and future APN roles.
- Integrate the perspectives of relevant stakeholders in the planning, implementation, reporting, and uptake of APN role evaluations.

Target Audience

The main target audience is government policymakers, healthcare funders and administrators, and leaders of nursing associations who may sponsor or direct evaluations. They are also influential knowledge users who require evaluation data to make evidence-informed decisions about APN roles. Other framework users may include researchers, healthcare planners, advanced practice nurses, and APN educators.

Framework Assumptions and Concepts

Figure 1 illustrates a matrix of the major framework concepts arising from group discussions and examination of the APN and healthcare evaluation literature. Three assumptions informed the scope of the framework. The first assumption was that the framework should be broad and flexible so that evaluations can accommodate the evolving nature of APN roles in Switzerland and to ensure the relevance of evaluations over time as the roles develop. Opportunities exist to define current roles and to introduce other APN roles for a broad range of patient populations in diverse models of care and practice settings. Different APN roles such as CNSs or NPs have distinct competencies, scopes of practice, job descriptions, and expected outcomes (Schober, 2013). It is important for the framework to not only inform these aspects of APN role development, but also accommodate new roles as they emerge. In the framework matrix, the concept of “type of APN role” is identified to highlight the framework’s applicability to varied APN roles and the

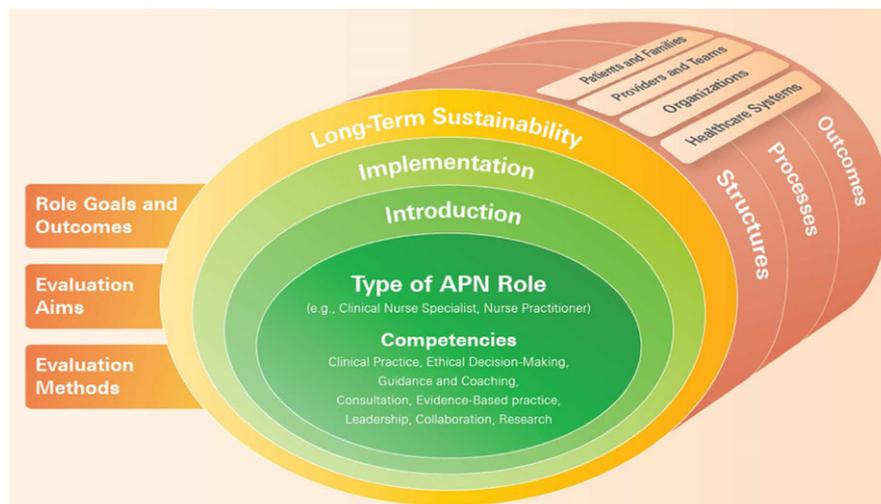


Figure 1. Evaluation framework matrix—key concepts for evaluating advanced practice nursing roles.

importance of examining unique APN role characteristics in evaluations.

A second assumption was that evaluating the outcomes of APN roles, to assess their benefits for the Swiss health-care system, was of primary importance. However, the evaluation of outcomes must also consider factors related to APN role development. Swiss APN roles are in various stages of development within and across organizations and regions. Expectations for evaluating outcomes must reflect these differences in role maturity. Since many roles are new or under construction, barriers to optimal implementation may exist that negatively impact on outcomes. In addition, little is known about the financial, legal, or administrative structures needed in Switzerland to support effective APN roles. The framework concept of “stage of APN role development” stresses the importance of addressing developmental issues in evaluations.

PEPPA provided conceptual clarity by distinguishing three stages of role development—introduction, implementation, and long-term sustainability—as shown in the matrix (see **Figure 1**), each with important considerations for evaluation (Bryant-Lukosius & DiCenso, 2004). The introduction stage involves identifying the patient population(s) to be the focus of the APN role and engaging stakeholders to establish the need, determine priority role goals and outcomes, define the role, and develop an implementation and evaluation plan. The matrix concept of “role goals and outcomes” is foundational to establishing the evaluation plan and creating a clearly defined APN role with activities linked to achieve specific outcomes. The implementation stage involves putting resources in place to support APN role development (e.g., education, policies), recruiting and hiring, and evaluating role implementation and progress in achieving outcomes.

The long-term sustainability stage focuses on monitoring and evaluating to assess role impact and health system integration, and to identify new or continuing needs for the role.

The third assumption was that the framework must support APN evaluations examining a broad range of aims, issues, and stakeholder perspectives. Three matrix concepts (see **Figure 1**) are linked to this assumption. “Role goals and outcomes” for different types of roles and roles at different stages of development will influence information needs and thus evaluation aims, objectives, questions, and methods. “Evaluation aims” may be to explore, describe, understand, assess, explain, or predict aspects of APN roles. Depending on the aim, a number of research (e.g., qualitative, quantitative, mixed methods) or evaluation (e.g., program evaluation, quality improvement) methods may be relevant (Bowling, 2009). The concept “evaluation methods” is highlighted in the matrix to emphasize the importance of diverse evaluation approaches.

Medical Research Council guidelines recommend the use of systematic approaches and diverse evaluation methods to design and examine complex healthcare innovations such as APN roles (Craig et al., 2008). APN role complexity is characterized by interacting competencies (e.g., clinical, research, leadership); focus on challenging healthcare issues requiring actions targeted to multiple groups (e.g., patients, communities, providers, organizations); and the high degree of flexibility and responsiveness required to meet dynamic patient and health system needs (Bryant-Lukosius et al., 2013). Thus, the aims and methods of APN evaluations should reflect the complexity of these roles and the healthcare environments in which they work.

Published APN evaluation models were compared related to their areas of focus, major concepts, applicability, strengths, and limitations. We could not come to a consensus on adopting or adapting one of these models for the framework. Each model had strengths, but in relation to the framework's objectives were limited by their focus on a specific role (Kilpatrick, Lavoie-Tremblay, Lamothe, Ritchie, & Doran, 2012; Sidani & Irvine, 1999), aspect of care (Mitchell, Ferketich, Jennings, & American Academy of Nursing Expert Panel on Quality Health Care, 1998), or quality improvement (National Council for Nursing and Midwifery, 2008); and the lack of complexity (Byers & Brunell, 1998).

A consistent feature of the APN models and PEPPA was the integration of Donabedian's (2005) model. The Donabedian model is relevant for evaluating the quality of healthcare and also for APN evaluations (Gardner, Gardner, & O'Connell, 2013; Nagendran, Maruthappu, & Raleigh, 2011). Given its applicability, Donabedian's (2005) model provided core matrix concepts related to "structures," "processes," and "outcomes" (see **Figure 1**). Structures are the practical, human, physical, and environmental factors (organizational, cultural, political, economic) that influence how APN roles are implemented (Bryant-Lukosius & DiCenso, 2004).

Processes refer to APN role implementation or the types of services and interventions provided and how they are delivered. A core matrix concept is "competencies." To promote the optimal use of nursing expertise and scope of practice, examination of role processes should consider activities relevant to APN competencies (Bryant-Lukosius & DiCenso, 2004). The competencies defined by Hamric (2014) were included in the matrix because of their use in Swiss APN education programs and familiarity among advanced practice nurses. They comprise clinical practice, ethical decision making, guidance and coaching, consultation, evidence-based practice, leadership, and collaboration. Competency related to research (Sastre-Fullana, De Pedro-Gomez, Bannasar-Veny, Serrano-Gallardo, & Morales-Asencio, 2014) was also identified as important. Another essential process factor is the APN role dose. The dose can be affected by the frequency and intensity of advanced practice nurse and patient interactions, education and experience, and target population responsiveness to interventions (Brooten, Youngblut, Deosires, Singhala, & Guido-Sanz, 2012). Monitoring the dose and factors influencing the dose can determine if adjustments in APN role processes or structures are required to optimize outcomes.

Outcomes are the results of APN role structures and processes. Our review of APN models found that outcomes can be evaluated from the varied perspectives of patients (including populations and communities);

family members; healthcare providers and teams; and decision makers (e.g., managers, policymakers) in organizations and the broader healthcare system (e.g., governments; Bryant-Lukosius & DiCenso, 2004; Byers & Brunell, 1998; Kilpatrick et al., 2012; Sidani & Irvine, 1999). These perspectives are included as core matrix concepts related to "patients and families," "providers and teams," "organizations," and "healthcare systems."

To determine outcomes to include in the framework, we identified APN-sensitive outcomes from systematic reviews (Bryant-Lukosius et al., 2015; Donald et al., 2015; Kilpatrick et al., 2014; Martin-Misener et al., 2015; Newhouse et al., 2011) and compared these with outcomes defined in APN (Doran, Sidani, & DePietro, 2010; Ingersoll, McIntosh, & Williams, 2000; Kleinpell, 2009) and healthcare (Institute of Health Improvement, 2012; Institute of Medicine [IOM], 2001) models. Through discussion and consensus, a detailed list of outcomes was distilled and categorized into these groups: patient and family, healthcare provider and stakeholder, quality of care, organization, and healthcare use and costs. These outcomes align with those identified by the IOM (2001) and with Swiss Federal Office of Public Health (2013) priorities to promote quality of life, empower patients, and improve healthcare quality.

Role Development and Evaluation Objectives

Based on PEPPA and group consensus, the following evaluation objectives were defined for each stage of APN role development.

Introduction Stage

- Determine patient, family, healthcare provider/team, organization, and health system needs in Switzerland that can be met by APN roles in varied practice settings and models of care.
- Promote APN role clarity among Swiss stakeholders by ensuring a good match between identified needs and the type of APN role, role competencies, and scope of practice.

Implementation Stage

- Ensure that appropriate professional, educational, organizational, and healthcare system policies, funding, and resources are in place to support the introduction of varied APN roles in different practice settings and models of care delivery in Switzerland.
- Improve understanding about how APN roles impact patient, family, healthcare provider/team, organization, and health system outcomes in Switzerland.

- Promote optimal utilization and implementation of APN roles and achievement of expected outcomes in Switzerland by monitoring trends in practice patterns, including deployment, retention, role activities, and barriers and facilitators to role implementation.

Long-Term Sustainability Stage

- Demonstrate the long-term benefits and impact of APN roles for healthcare consumers, providers, organizations, and the overall healthcare systems in Switzerland.
- Ensure APN roles meet the long-term needs of the Swiss healthcare system by identifying ongoing developments, trends, and needs for role revision and support.

Framework Tools

APN evaluations may not occur due to uncertainty about where and how to begin what is perceived to be a daunting task (Bryant-Lukosius, 2009). To overcome this barrier and to facilitate framework application, serial tools were developed (see Appendices with online version of this article). The first tool maps evaluation objectives with examples of structures, processes, and outcomes for each stage of APN role development to generate ideas about information needs and evaluation priorities. Next, an expanded version of this tool offers a template of evaluation questions examining APN role structures, processes, and outcomes. A third tool helps formulate an evaluation plan including the methods. Lastly, a fictional case study integrates matrix concepts to demonstrate framework application for each stage of APN role development. In the introduction stage of the case study, a hospital administrator is confronted by an unexplained rise in emergency department (ED) visits by adults with type II diabetes. This prompts an evaluation plan to identify contributing factors and solutions for reducing unnecessary ED visits. Results of this evaluation are used in the implementation stage to define an APN role and new model of care and create a plan to evaluate the implementation and impact of the APN role and new care delivery processes. In the long-term sustainability stage, the APN role is deemed fully functional and an economic analysis is planned to inform decisions about maintaining the APN role and model of care.

Expert Panel Feedback

Expert panel feedback on the framework and tools was positive, with mean review form scores ranging from 4.0 to 4.6 (scale: 1 = *poor*, 5 = *excellent*) for format,

clarity, content, and application. Perceived framework strengths were that it was patient centered, comprehensive, demonstrated the complexity of APN roles and contexts, and sufficiently broad to permit diverse use. Other strengths related to the conceptual and evidence-based foundations of the framework. A suggested area for improvement was to provide more instruction on how to operationalize the framework, which was addressed by adding a section on “how to use the framework.” Other comments related to generic healthcare evaluation issues like assessing readiness for change, managing political environments, and measurement.

Discussion

While factors such as economics, politics, and policy priorities are also influential, the lack of meaningful and policy-relevant evaluation data to make decisions about the optimal design, implementation, and use of APN roles is a significant barrier to effective role planning, role clarity, and integration within healthcare systems (Bryant-Lukosius, 2014; DiCenso et al., 2010). As a result, the full potential of APN to improve patient health, increase access to care, contain costs, and strengthen care quality has not been realized, even in countries with established roles. Ireland has demonstrated the feasibility of systematically evaluating the introduction of APN roles to understand their impact on national goals for healthcare redesign (Begley et al., 2010). While similar evaluations may be more difficult to conduct in larger countries and those with the less centralized healthcare systems like Switzerland, a common national framework may improve understanding of APN role impact by enabling comparative evaluations across jurisdictions. In countries with established APN roles, the framework may inform evaluation needs by determining if evaluation objectives at each role development stage have been met. The framework provides a novel and staged approach to encourage and improve APN evaluations. As the case study illustrates, the introduction stage emphasizes healthcare redesign to examine a number of solutions, including an APN role. This strategy helps to ensure the APN role is a good fit and is clearly defined (e.g., an APN role for community-living adults with type II diabetes) to meet identified needs (factors resulting in rising ED visits) and to generate baseline data for ongoing evaluation. By starting with needs for healthcare redesign, patient, provider, organization, and system perspectives can be incorporated in the evaluation.

The framework promotes systematic and appropriately timed evaluations by defining evaluation objectives for each stage of role development. The objectives

facilitate focused and feasible evaluations and avoid premature outcome assessments of underdeveloped roles. This strategy is exemplified in the case study where outcomes such as cost effectiveness are evaluated in the long-term sustainability stage. The framework fosters comprehensive evaluations to inform implementation strategies and improve understanding about role impact by examining structures, processes, and outcomes relevant to APN competencies (Gardner et al., 2013). This aspect is evident in the implementation stage, where structures (patient characteristics) are examined related to APN role processes (interactions) and their combined effects on outcomes from patient (self-care), provider (satisfaction), organization (care quality), and health system (healthcare use) perspectives. By advocating for decision maker involvement in evaluation planning and embracing the use of diverse methods to evaluate roles from varied perspectives, the framework will promote a deeper understanding of the benefits of APN roles and the production of policy-relevant data for decision making (Finewood & MacLeod, 2015).

Different stakeholder groups can apply the framework to address their information needs. Government policy-makers can use the framework to evaluate the deployment of APN roles to achieve improvement priorities (e.g., access to care) for specific patient populations (e.g., frail elderly). Educators may want to know how effective university programs are in preparing nurses for advanced roles. Understanding the effect of implementation strategies (e.g., mentorship) on APN role retention may be vital to administrators. Advanced practice nurses can use the framework to assess their progress in meeting expected outcomes. To inform decisions about long-term sustainability, researchers could examine factors to predict the patient populations and models of care where APN roles are most cost effective.

However, since not all stakeholders may recognize their important role in APN role evaluations, engaging them in framework application or participation in evaluations may be challenging (Bryant-Lukosius, 2009). Concerted efforts will be necessary to make target users aware of the framework, understand its potential for generating meaningful data for healthcare decision making, and know how to apply it (Wensing, Bosch, & Grol, 2009). We plan to collaborate with Swiss government policymakers and nursing associations to translate the framework into German and French, disseminate and facilitate framework understanding, and develop a toolkit to support its application. Based on expert panel advice, the toolkit will include generic evaluation resources pertinent to matrix concepts such as developing an evaluation plan, selecting evaluation methods, and measuring structures, processes, and outcomes. Pilot projects in

Switzerland and Canada will be conducted to evaluate and refine the framework and toolkit.

Conclusions

New approaches are required to improve evaluations of APN roles as complex healthcare interventions and to better address the information needs of healthcare decision makers. Through international collaboration, a robust, evidence-based, and practical framework was developed to evaluate APN roles across three stages of role development. The broad scope of the framework permits its application to a range of APN roles in Switzerland and other developed countries.

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Clinical Resources

- Advanced Practice Nursing Data Collection Toolkit: <http://apntoolkit.mcmaster.ca/>
- Canadian Centre for Advanced Practice Nursing Research: <http://fhs.mcmaster.ca/ccapnr/>

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's web site:

Table S1. Framework Assumptions to Address Contextual Issues from Varied

Table S2. Examples of APN Role Structures

Table S3. APN Role Outcomes

Appendix A. Evaluation Objectives and Example Concepts by Stage of Role Development

Appendix B. Evaluation Plan Template

Appendix C. Case Scenario Demonstrating Vertical and Horizontal Integration and Application of Evaluation Framework Concepts

Appendix D. Glossary of Terms